



# **Metro Vancouver Rapid Transit**

**Presented by:**

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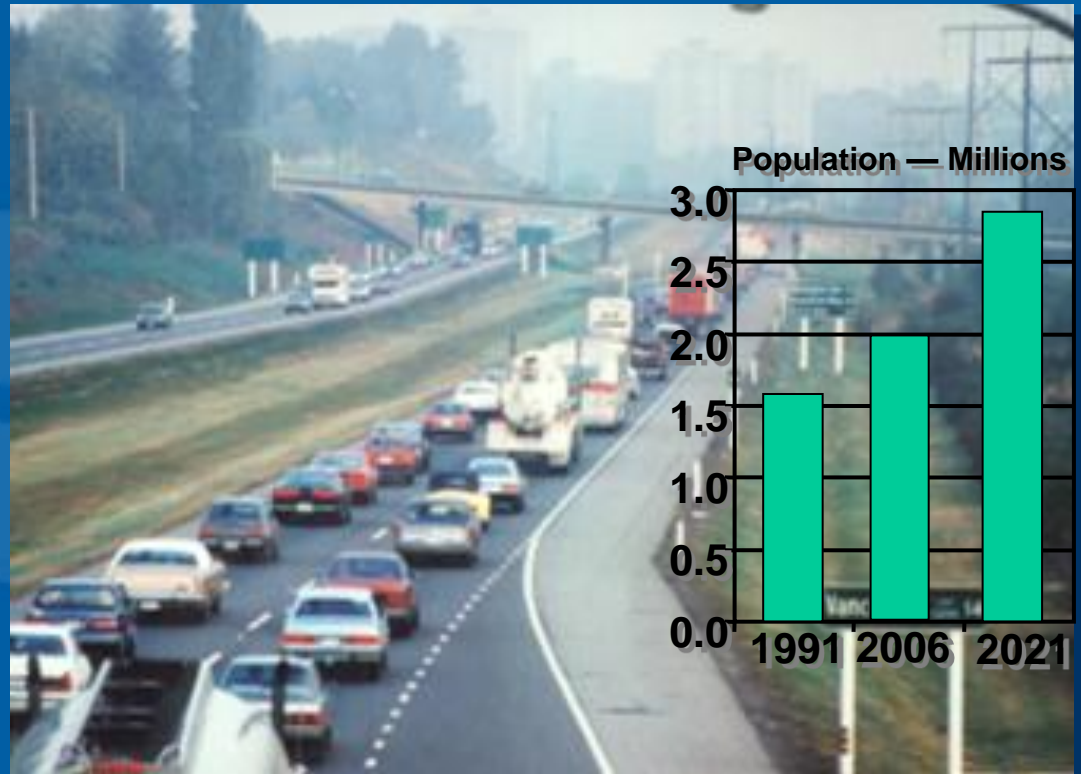
# Metro Vancouver

- **Canada's 3<sup>rd</sup> largest metropolitan region**
- **Strategically located**
- **Moderate climate, and quality of life make it a highly desirable location**
- **One of the most livable places in the world.**



# Metro Vancouver

- **Population is currently over 2.2 million and increasing**
- **Traffic congestion is increasing**
- **No freeways connecting into downtown**





# Metro Vancouver Regional Growth Strategy

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**Provide Framework  
for Future Growth**



**Build Complete  
Communities**



**Protect Green  
Zones**



**Increase  
Transportation  
Choices**



# SkyTrain System

**Longest automated & unattended transit system**

**Over 21 years of successful safe operation**

**49 kilometers**

- **elevated – 42 km**
- **at grade – 5 km**
- **tunnel – 2 km**

**33 stations**

**210 vehicles**



*mostly elevated above the roadways and avoids traffic congestion*



# Why SkyTrain? – Urban Fit

**Low noise and vibration**

**Electric operation**

**Minimal visual impact  
(unobtrusive elevated  
guideways)**

**Fast, frequent service of  
short length trains enable  
small stations**



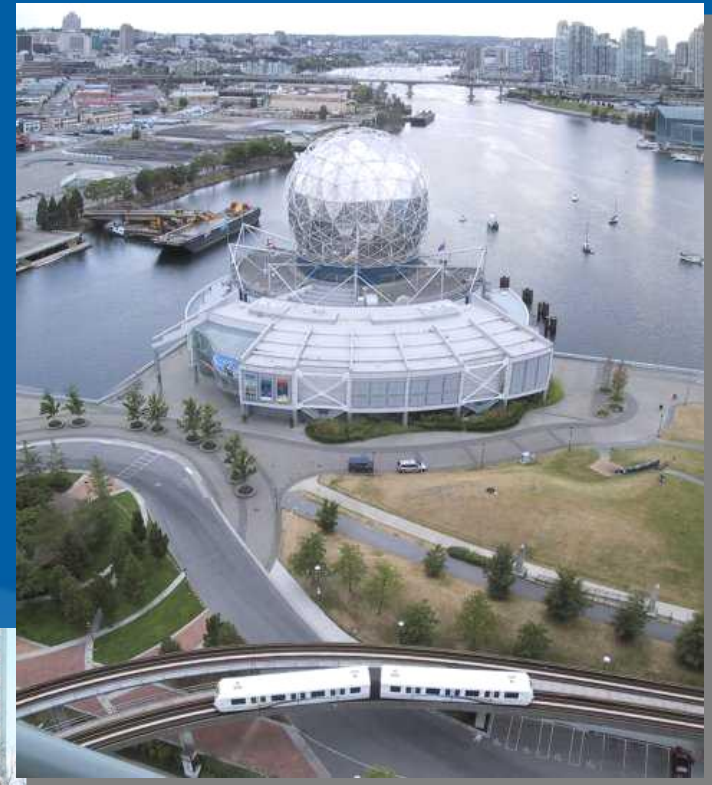


# Why SkyTrain? - Design Flexibility

## Flexible alignment design

- steep grades - 6.5%
- small turning radius – 70m

Capable of expansion to meet future capacity demands



# Why SkyTrain? – System Performance

**Intermediate capacity  
(10k to 30k passengers per  
hour per direction)**

**Fail-safe automated, driverless  
unattended operation**

**Reliable**

**All weather operation**







Vancouver

Airport

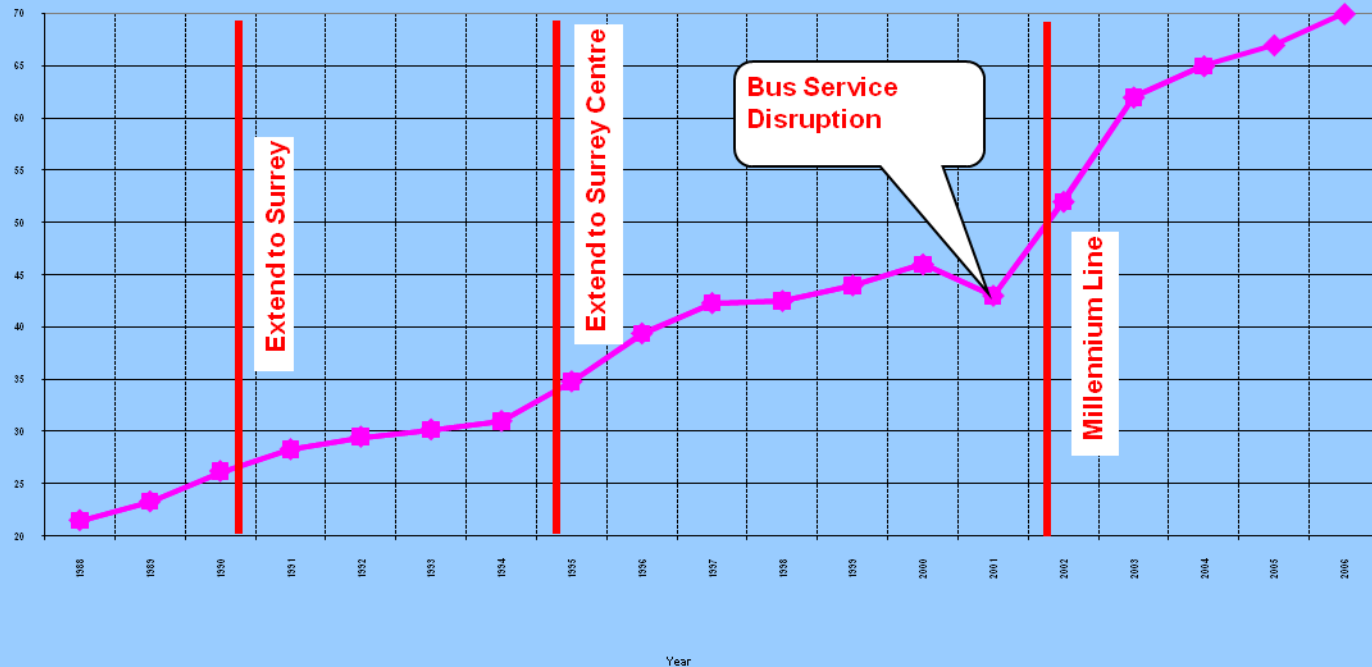
Richmond



CANADA LINE

# SkyTrain – Ridership

Passenger Boardings Per Year (Millions)



SkyTrain ridership increased by over 300% in the first 20 years



# SkyTrain Growth 1987 - 2007

	1987	2007	Δ%
Distance	21 km	49 km	233%
Stations	15	33	220%
Cars	114	210	184%
Employees	~300	~540	180%
Car-kms	12.9 M	34.9 M	270%
Annual boardings	20 M	71 M	355%
Weekday Boardings	65,000	240,000	369%





# Automatic Train Control

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## Benefits of Automatic Train Control:

- **Safety:** ATC minimizes routine human error. SkyTrain ATC has proven safety record with 160 million train-kms in 23 years of operation with zero accidents occurring under ATC control
- **Shorter Station Platforms:** reduced station and land costs through operation of shorter trains at higher frequency
- **Delay Recovery:** spare trains can be inserted into service immediately from strategic storage points to reduce or eliminate downstream gaps; delayed trains can be reassigned to maintain spacing



# Automatic Train Control

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## Benefits of Automatic Train Control:

- **Reliability:** Train Availability for SkyTrain has been consistently at 98% On-Time Scheduled Trains and Avg. 95% since commencement of operations in 1985;
- **Flexibility:** Allows for Shorter Trains at higher frequency at the same operating Costs. Train every 2 min at peak hour, every 3 min in mid-day and evenings, every 4 min late night
- **Travel Time:** Automated speed control is accurate and consistent together with fully separated guideway allows for shorter overall travel times.



# SkyTrain - Expo Line

**Entered revenue service  
in 1986**

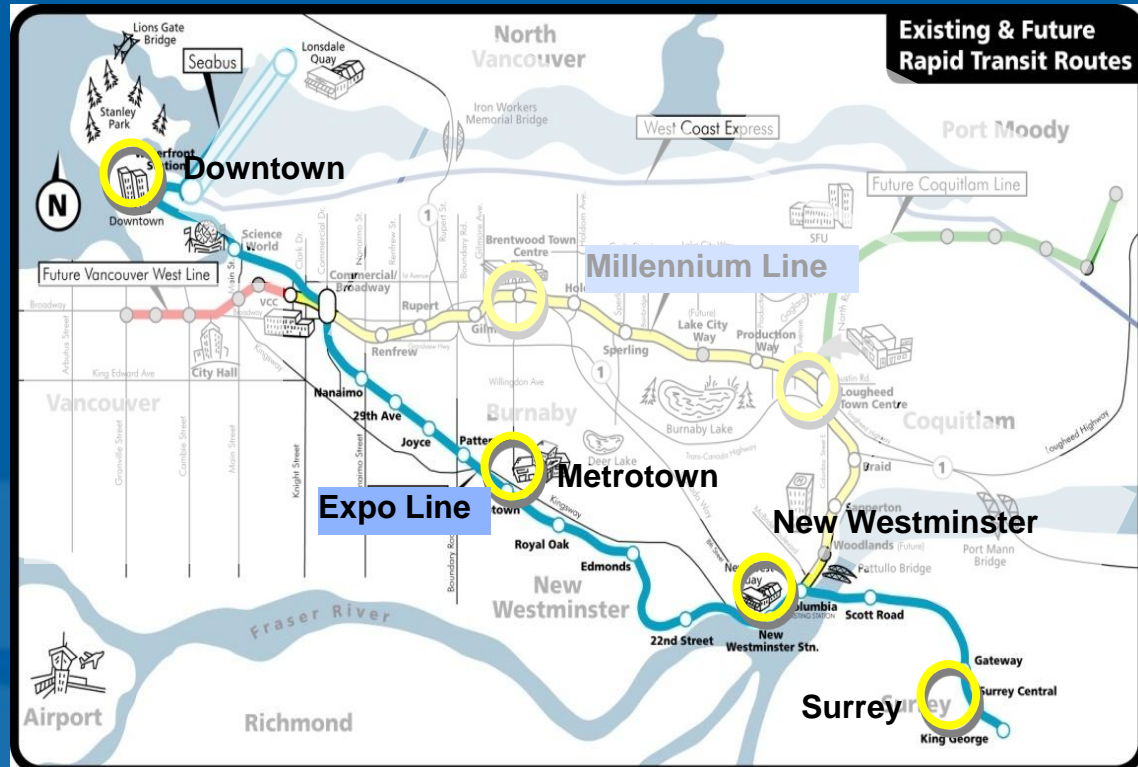
## **Expo Line**

- 29 kilometers
- 20 stations
- 150 vehicles

**Connects 4 town centers**

**Peak time ridership**

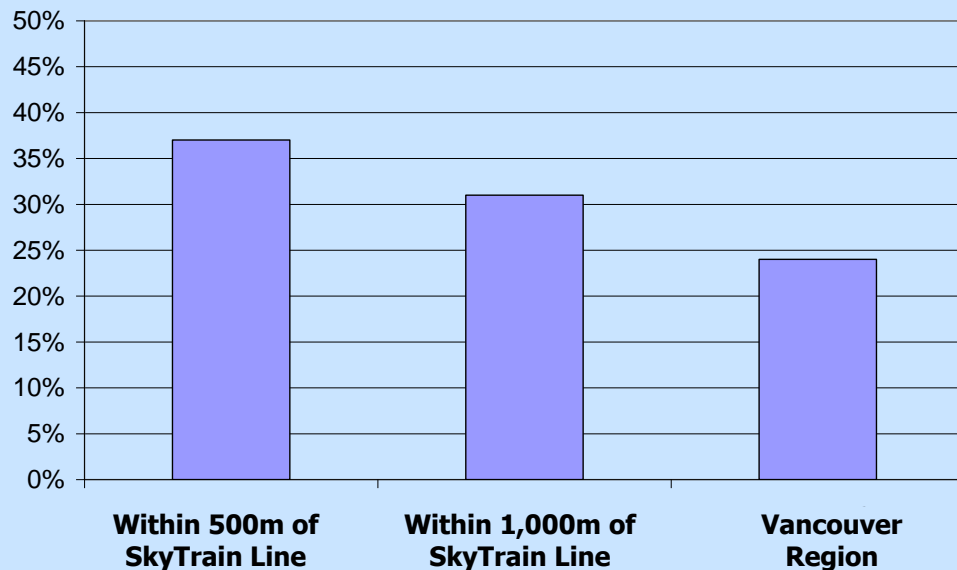
- 14,000+ passengers  
per hour per direction





# Shaping Urban Density

Percentage Growth in Population, 1991 to 2001

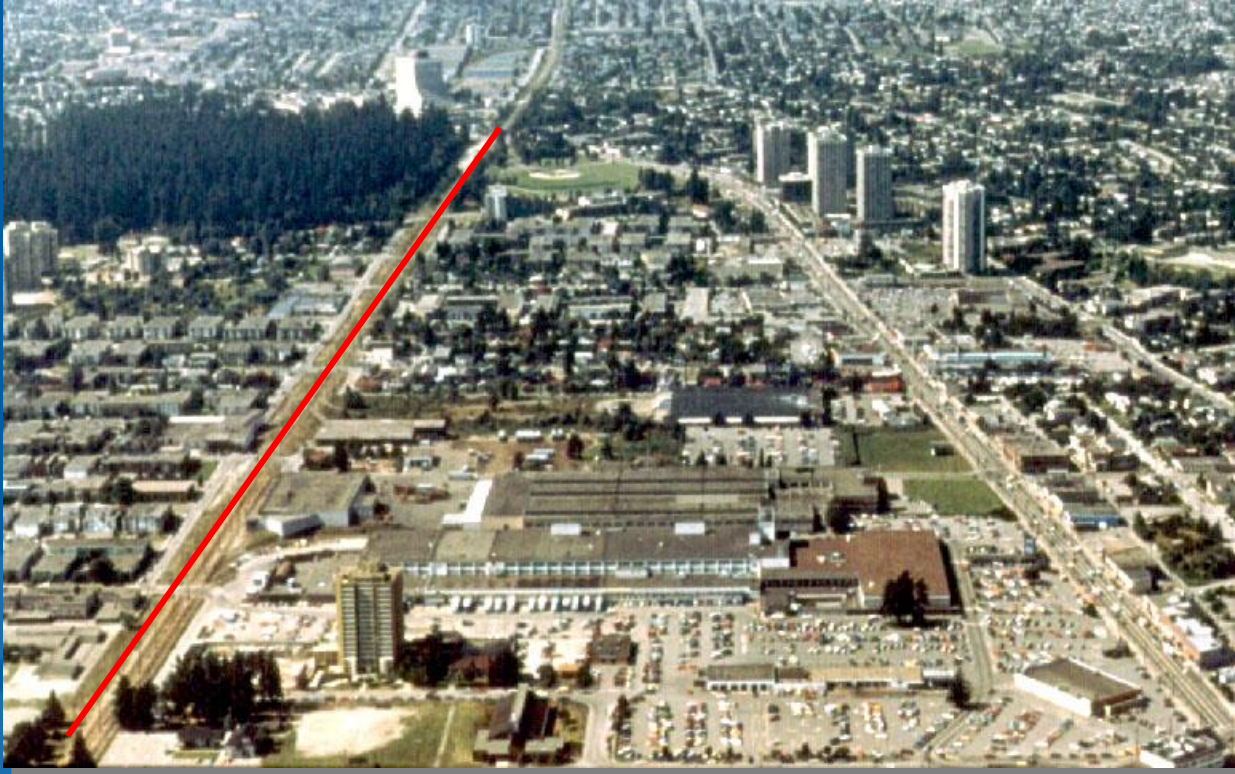


**Between 1991 and 2001, population within 500 metres of SkyTrain increased by 37% compared to the regional average of 24%**



# **Metrotown Before SkyTrain (early 1980s)**

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**Before SkyTrain was built, city planners had decided to establish Metrotown as a regional and city town center**





# **Metrotown**

## **20 Years After SkyTrain**

**Today Metrotown is a true mixed use, transit-oriented development in the precise location where planners wanted it to happen:**



**Over 13,000 residential dwelling units within walking distance (300m) of the station**  
**Three interconnected shopping centers and office complexes**







METROTOWN STATION

McKAY AVE

X AVE

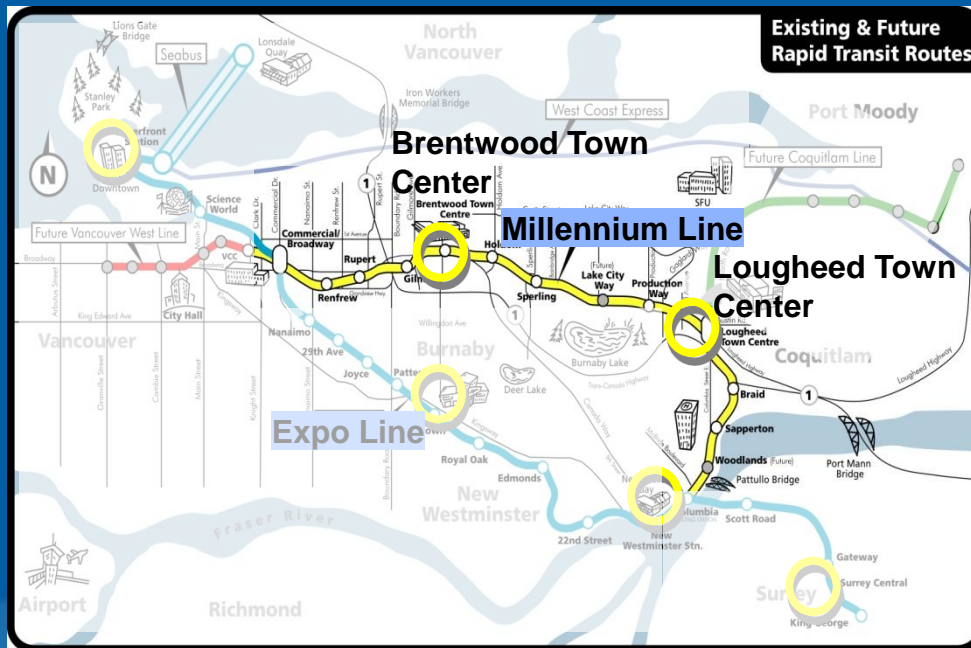
SUSSEX







# SkyTrain - Millennium Line



Alignment was controversial and there were predictions the new line would be a white elephant with negligible ridership

Entered revenue service in 2002

**Millennium Line**

- 20 kilometers
- 13 stations

Connects 2 town centers

Peak time ridership = 5,000 + passengers per hour per direction and rising at over 5% per year without fleet expansion





# Millennium Line

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**Built in large part to shape the urban development in Greater Vancouver and create a series of dense regional town centers**

**Although only in service for 6 years, adjacent development has been significant**

**As designed by city plans and zoning decisions, rapid growth is occurring at predetermined locations**



# Gilmore Station



**Since the Millennium Line entered service high rise condominiums have been constructed with retail and over 1,000 residential units**

**Growth adjacent to Gilmore station is expected to continue. In fact the station roof is designed to be easily disassembled to allow Gilmore to be incorporated into a new commercial complex.**



# Canada Line

## “Fixed Points”

Technology:	Automated Light Metro System
Length of Line:	19 km
No. of Stations (2009):	16
Estimated Daily Riders (2010):	100,000
Water Crossings:	2 bridges + 1 tunnel
Equivalent Road Capacity:	10 lanes
Project Cost:	\$2.054 billion





# Route

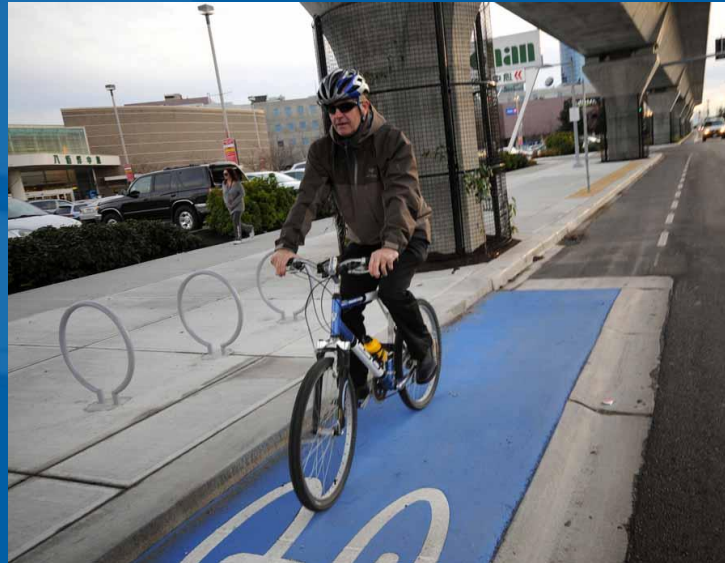


# Future Development at Aberdeen Station





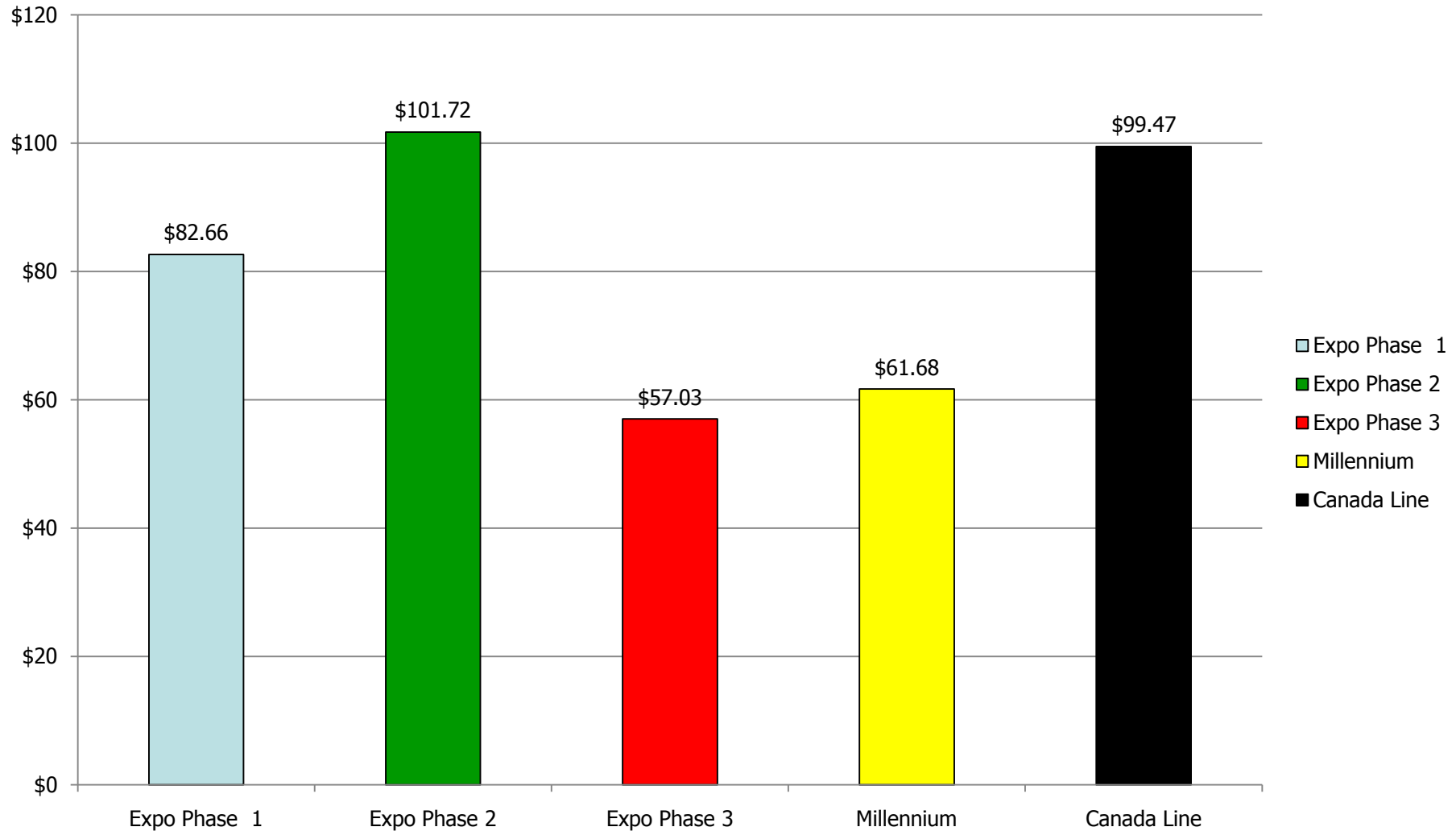
# No. 3 Road Vision





# Capital Costs/Kilometer

(\$2003 million)





# Millennium Line Construction – Brentwood Station





# Millennium Line Construction – Brentwood Station





# Millennium Line – Guideway at Brentwood Station





Canada Line –  
Guideway along No. 3 Road



05/21/2009



North Arm Bridge





Bike Bridge on  
North Arm Bridge



06/11/2009

# King Edward Station





# YVR-Airport Station



05/27/2009



# Sea Island Centre Station





# Canada Line Vehicle



2009.06.11 15:38





# Conclusion

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**Frequent service of automated trains continue to attract riders and stimulate high density transit oriented developments in Metro Vancouver.**

**Metro Vancouver has successfully shaped growth with regional destinations while significantly reducing the reliance on the automobile with an integrated transit system.**





THANK YOU!  
MERCI!

questions?